## CORRECTED VERSION

### (19) World Intellectual Property Organization

International Bureau





(43) International Publication Date 1 September 2005 (01.09.2005)

**PCT** 

# (10) International Publication Number WO 2005/080781 A1

(51) International Patent Classification<sup>7</sup>: F02M 25/07, F02B 47/08

(21) International Application Number:

PCT/NZ2005/000011

- (22) International Filing Date: 7 February 2005 (07.02.2005)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:

531314 23 Februa

23 February 2004 (23.02.2004) NZ

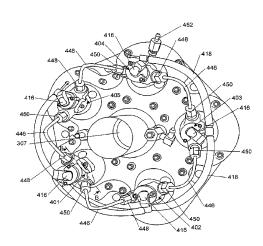
- (71) Applicant (for all designated States except US): SHUT-TLEWORTH AXIAL MOTOR COMPANY LIMITED [NZ/NZ]; 110 Marsden Valley Road, Nelson (NZ).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): SHUTTLEWORTH,

**Richard, Jack,** [NZ/NZ]; 110 Marsden Valley Road, Nelson (NZ).

- (74) Agents: ADAMS, Matthew, D et al.; A J Park, 6th Floor Huddart Parker Building, Post Office Square, P O Box 949, Wellington, 6015 (NZ).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

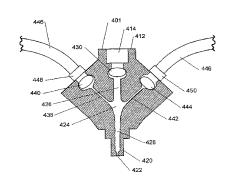
[Continued on next page]

#### (54) Title: RECIRCULATION SYSTEM FOR MOTOR



(57) Abstract: A motor has an engine block with cylinders arranged to fire in a firing order. A recirculation system delivers combusted mixture from a cylinder which has just fired to at least partly mix with fuel for the next cylinder in the firing order. Injector bodies (401-405) are associated with each cylinder. Each injector body (401-405) has an internal chamber (424) in communication with a fuel inlet port (426) for delivering fuel into the internal chamber, a fuel outlet port (428) for delivering fuel under pressure from the chamber into the associated cylinder and a combusted mixture outlet port (442). The combusted mixture outlet port (442) of each injector body (401-405) is fluidly connected to the combusted mixture inlet port (438) of the next cylinder in the firing order. Alternatively, the recirculation system is arranged substantially internally within the cylinder head.





## WO 2005/080781 A1



(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

#### **Published:**

— with international search report

(48) Date of publication of this corrected version:

6 October 2005

(15) Information about Correction:

see PCT Gazette No. 40/2005 of 6 October 2005, Section II

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.